Listing of Claims

Claim 1 (Previously Presented): A method of processing a packet in a gateway device comprising a plurality of physical ports, each of said plurality of physical ports being coupled to a corresponding one of a plurality of communication paths providing connection with a corresponding network, said method comprising:

providing a search utility in said gateway, said search utility enabling the retrieval of both a forwarding information and a network address translation (NAT) information necessary for processing said packet in a single search operation, wherein said NAT information specifies a new address for an original address in said packet, said forwarding information specifying one of said plurality of physical ports for forwarding said packet;

receiving said packet containing said original address;

determining said forwarding information and said NAT information for said packet in a single search operation by using said search utility;

substituting said new address for said original address in said packet; and

forwarding said packet with said new address on the specified one of said plurality of physical ports.

Claim 2 (Previously Presented): The method of claim 1, wherein said providing comprises maintaining a single table for both said forwarding information and said NAT information.

Claim 3 (Previously Presented): The method of claim 2, wherein said maintaining comprises storing said single table in a content addressable memory (CAM) indexed by a source address and a destination address, wherein said determining comprises providing the source address and destination address in said packet as a key to said CAM to retrieve said forwarding information and said NAT information.

Claim 4 (original): The method of claim 3, wherein said CAM comprises a multi-way CAM.

Claim 5 (Previously Presented): The method of claim 2, wherein said gateway device comprises a service selection gateway (SSG) connecting a plurality of remote systems to a plurality of service domains, wherein one of said original address and said new address comprises a local address of a remote system and the other address comprises an external address in a service domain for said remote system, said maintaining further comprises:

storing NAT information and forwarding information in a plurality of tables partitioned according to service domains such that forwarding information and NAT information related to the same service domain is stored in the same one of said plurality of tables.

Claim 6 (Previously Presented): The method of claim 5, wherein at least one of said plurality of tables stores NAT information and forwarding information related to at least a first service domain and a second service domain contained in said plurality of service domains, said first service domain and said second service domain respectively containing a first set of addresses and a second set of addresses accessible from said gateway device, wherein said first set of addresses and said second set of addresses do not overlap.

Claim 7 (Original): The method of claim 1, wherein said forwarding information comprises an interface on said gateway device, wherein said forwarding comprises sending said packet on said interface, wherein said packet is received in the form of an Internet Protocol (IP) packet.

Claim 8 (Previously Presented):A gateway device for processing a packet, said gateway device comprising:

a plurality of physical ports, each of said plurality of physical ports being coupled to a corresponding one of a plurality of communication paths providing connection with a corresponding network;

means for searching enabling the retrieval of both a forwarding information and a network address translation (NAT) information necessary for processing said packet in a single search operation, wherein said NAT information specifies a new address for an

original address in said packet, and said forwarding information specifying one of said plurality of physical ports for forwarding said packet;

means for receiving said packet containing said original address;

means for determining said forwarding information and said NAT information for said packet by using said single search;

means for substituting said new address for said original address in said packet; and

means for forwarding said packet with said new address on the specified one of said plurality of physical ports.

Claim 9 (Previously Presented): The gateway device of claim 8, wherein said means for searching maintains a single table for both said forwarding information and said NAT information

Claim 10 (Previously Presented): The gateway device of claim 9, wherein a memory means stores said single table in a content addressable memory (CAM) indexed by a source address and a destination address, wherein said means for determining comprises means for providing the source address and destination address in said packet as a key to said CAM to retrieve said forwarding information and said NAT information.

Claim 11 (Original): The gateway device of claim 10, wherein said CAM comprises a multi-way CAM, said packet comprises an IP packet, and said forwarding information comprises an interface on said gateway device, wherein said means for forwarding sends said packet on said interface.

Claim 12 (Previously Presented): The gateway device of claim 10, wherein said gateway device comprises a service selection gateway (SSG) connecting a plurality of remote systems to a plurality of service domains, wherein one of said original address and said new address comprises a local address of a remote system and the other address comprises an external address in a service domain for said remote system, said memory means stores NAT information and forwarding information in a plurality of tables partitioned according to

service domains such that forwarding information and NAT information related to the same service domain is stored in the same one of said plurality of tables.

Claim 13 (Previously Presented): The gateway device of claim 12, wherein at least one of said plurality of tables stores NAT information and forwarding information related to at least a first service domain and a second service domain contained in said plurality of service domains, said first service domain and said second service domain respectively containing a first set of addresses and a second set of addresses accessible from said gateway device, wherein said first set of addresses and said second set of addresses do not overlap.

Claim 14 (Previously Presented): A computer readable medium carrying one or more sequences of instructions for causing a gateway device to process a packet, said gateway device comprising a plurality of physical ports, each of said plurality of physical ports being coupled to a corresponding one of a plurality of communication paths providing connection with a corresponding network, wherein execution of said one or more sequences of instructions by one or more processors contained in said gateway device causes said one or more processors to perform the actions of:

providing a search utility in said gateway, said search utility enabling the retrieval of both a forwarding information and a network address translation (NAT) information necessary for processing said packet in a single search operation, wherein said NAT information specifies a new address for an original address in said packet and said forwarding information specifies one of said plurality of physical ports for forwarding said packet;

receiving said packet containing said original address;

determining said forwarding information and said NAT information for said packet in a single search operation by using said search utility;

substituting said new address for said original address in said packet; and

forwarding said packet with said new address on the specified one of said plurality of physical ports.

Claim 15 (Previously Presented): The computer readable medium of claim 14, wherein said providing comprises maintaining a single table for both said forwarding information and said NAT information.

Claim 16 (Previously Presented): The computer readable medium of claim 15, wherein said maintaining comprises storing said single table in a content addressable memory (CAM) indexed by a source address and a destination address, wherein said determining comprises providing the source address and destination address in said packet as a key to said CAM to retrieve said forwarding information and said NAT information.

Claim 17 (original): The computer readable medium of claim 16, wherein said CAM comprises a multi-way CAM and said packet is received in the form of an IP packet.

Claim 18 (Previously Presented): The computer readable medium of claim 15, wherein said gateway device comprises a service selection gateway (SSG) connecting a plurality of remote systems to a plurality of service domains, wherein one of said original address and said new address comprises a local address of a remote system and the other address comprises an external address in a service domain for said remote system, said maintaining further comprises:

storing NAT information and forwarding information in a plurality of tables partitioned according to service domains such that forwarding information and NAT information related to the same service domain is stored in the same one of said plurality of tables.

Claim 19 (Previously Presented): The computer readable medium of claim 18, wherein at least one of said plurality of tables stores NAT information and forwarding information related to at least a first service domain and a second service domain contained in said plurality of service domains, said first service domain and said second service domain respectively containing a first set of addresses and a second set of addresses accessible from said gateway device, wherein said first set of addresses and said second set of addresses do not overlap.

Claim 20 (Previously Presented): A gateway device for processing a packet, said gateway device comprising:

a plurality of physical ports, each of said plurality of physical ports being coupled to a corresponding one of a plurality of communication paths providing connection with a corresponding network;

a memory unit storing a forwarding information and a network address translation (NAT) information necessary for processing said packet, wherein said NAT information specifies a new address for an original address in said packet, and said forwarding information specifying one of said plurality of physical ports for forwarding said packet;

an inbound interface receiving said packet containing said original address;

a forwarding and NAT block determining said forwarding information and said NAT information for said packet using a single search, said forwarding and NAT block substituting said new address for said original address in said packet; and

an outbound interface forwarding said packet with said new address on the specified one of said plurality of physical ports.

Claim 21 (Previously Presented): The gateway device of claim 20, wherein said memory unit stores said forwarding information and said NAT information in a single table.

Claim 22 (Previously Presented): The gateway device of claim 21, wherein said memory unit comprises a content addressable memory (CAM) indexed by a source address and a destination address, wherein said forwarding and NAT block sends the source address and destination address in said packet as a key to said CAM to retrieve said forwarding information and said NAT information.

Claim 23 (original): The gateway device of claim 22, wherein said CAM comprises a multi-way CAM and said packet comprises an IP packet.

Claim 24 (Previously Presented): The gateway device of claim 21, wherein said gateway device comprises a service selection gateway (SSG) connecting a plurality of remote

systems to a plurality of service domains, wherein one of said original address and said new address comprises a local address of a remote system and the other address comprises an external address in a service domain for said remote system, wherein said memory unit stores NAT information and forwarding information in a plurality of tables partitioned according to service domains such that forwarding information and NAT information related to the same service domain is stored in the same one of said plurality of tables.

Claim 25 (Previously Presented): The gateway device of claim 24, wherein at least one of said plurality of tables stores NAT information and forwarding information related to at least a first service domain and a second service domain contained in said plurality of service domains, said first service domain and said second service domain respectively containing a first set of addresses and a second set of addresses accessible from said gateway device, wherein said first set of addresses and said second set of addresses do not overlap.

Claim 26 (original): The gateway device of claim 25, further comprising a service selection block determining a specific service to which said packet relates to and causes said packet to be processed according to a corresponding one of said plurality of tables.

Claim 27 (Previously Presented): The gateway device of claim 26, further comprising a plurality of forwarding and NAT blocks wherein each of said plurality of forwarding and NAT blocks is coupled to a corresponding one of a plurality of memory units, wherein each of said plurality of memory units stores one of said plurality of tables.